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ABSTRACT

Independence for Africa has not resulted in the expected economic development of industrialization. Mineral-poor states in Africa must rely on limited prosperity coming from an expansion of agricultural commodities. The problem is that despite the prevalence of an agriculture economic base, most African leaders are committed to industrial development. The foundations of this antipathy of Africa's educated leadership and masses toward agriculture can be traced back to the period of colonialism when imperial interest created fluctuating monoculture states, status problems, agricultural coercion without incentives emphasizing authoritarian rules and orders, and disastrous agricultural experimentation. Migration to urban center and influences by the European boarding school system alienated Africans physically as well as psychologically from agriculture. Independence, then, exposed a dilemma in Africa between a passion for education and a reluctance to acknowledge the critical role of agriculture. Suggested strategies for improving attitudes toward agriculture include reorientation and political risks on the part of leaders, imaginative programs, encouragement of local participation in decision making, provision of economic incentives, possible land consolidation, creation of agricultural programs in all levels of education, and development of community schools. (Author/SJM)

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AGRICULTURE, EDUCATION, AND RURAL TRANSFORMATION –

with particular reference to East Africa

J. Gus Liebenow

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THE CARNEGIE SEMINAR ON
POLITICAL AND ADMINISTRATIVE
DEVELOPMENT

1969

Department of Political Science / Indiana University / Bloomington

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The paper that follows will be of interest to policy-makers, as well as to those whose interest in African politics and African development is primarily academic.

In it Professor Liebenow has drawn from half a generation of his own scholarship to lay out a broad and basic analysis, one that identifies what is probably the most critical general problem of current African development and one which explains how that problem came to be what it is. More than this, Professor Liebenow goes where scholars are usually reluctant to tread to outline prospective lines of action by which that problem can be attacked. Not often does one encounter so fruitful a product of scholarship.

In view of the perceptiveness and relevance of this analysis, we felt that Professor Liebenow's statement should be made available to a wide audience, beginning with our own Carnegie Seminar on Political and Administrative Development. His paper was originally prepared as part of the report "Institution Building and Rural Development: A Study of United States Technical Assistance Projects" (Bloomington: Indiana University, offset, 1968). That study, directed by Dr. David R. Derge, Professor of Political Science, and Vice-President and Dean for Administration, was part of a task undertaken by the Committee on Institutional Cooperation for the United States Agency for International Development.

The Carnegie Seminar on Political and Administrative Development was first conducted by Professor Fred W. Riggs, beginning in 1961, and was initially funded by a grant from the Carnegie Corporation. That grant has long been expended, but some of the work begun under its terms continues, directly financed by Indiana University.

Professor Liebenow has been an active participant in the Carnegie Seminar. In fact, his participation antedates the seminar itself; he served as chairman of the committee that undertook to seek financial assistance for studies of the political and administrative aspects of development change. About the same time, he became head of the University's newly created African Studies Program. His activities are a gratifying manifestation of the fact that there is no inevitable need to draw sharp lines between "area studies," "comparative politics," and studies of governmental involvement in social change. The statement that follows is part of the evidence. It is a worthy contribution to knowledge—and of knowledge to planning and shaping developmental strategies.

Additional copies may be obtained upon request.

Professor William J. Siffin, Director
Political and Administrative Development Program

PROFESSOR J. GUS LIEBENOW, Professor of Political Science, is a distinguished member of the faculty of Indiana University. Since 1961 he has also served as Chairman of the University's African Studies Program, playing a major role in the development of that program. He has been consultant to such organizations as the Ford Foundation, the Foreign Service Institute of the United States Department of State, the Peace Corps, and UNESCO. He is a Founding Fellow for the African Studies Association and former member of its board. He is currently a member of the editorial board of the *Journal of Politics* and has served in similar capacities for a number of other journals, including the *American Political Science Review,* the *Administrative Science Quarterly,* and the *African Studies Bulletin.*

Professor Liebenow's experience in Africa traces back to 1953 when he began a study of local government in the Sukuma, Nyaturu, and Chagga areas of what is now Tanzania. His African researches include studies of both government and education in East Africa, as well as investigations of local government, higher education, and political development in a number of West African countries. Professor Liebenow's research on African politics and African development has also involved him in work at a number of Western European sites. In addition, he participated in a joint UNESCO-American Friends Service Committee Project on basic education in Mexico during 1950-51.

Among the most recent of Professor Liebenow's writings is *Liberia: The Evolution of Privilege* (Cornell University Press, 1969). He contributed a chapter, "The One-Party State in West Africa," to William H. Lewis's volume, *French-Speaking Africa: The Search for Identity;* to volumes edited by Gwendolen M. Carter (*African One-Party States* and *Politics in Africa: Seven Cases*), by James S. Coleman and Carl G. Roseburg *(Political Parties and National Integration in Tropical Africa),* by Audrey L. Richards *(East African Chiefs),* and by William S. Livingston *(Federalism in the Commonwealth).* Other of his writings have appeared in the *American Political Science Review,* the *Journal of African Administration,* the *Western Political Quarterly,* and the *Administrative Science Quarterly.*

Agriculture, Education, and Rural Transformation—with particular reference to East Africa

J. Gus Liebenow

I The Problem

Throughout much of sub-Saharan Africa, the "Revolution of Rising Expectations" is rapidly giving way to a "Revolution of Rising Frustrations." The bright promise of a post-colonial world in which the problems of poverty, disease, and ignorance would be alleviated has not materialized for more than the privileged few. Independence has not enlarged the pool of investment capital and skilled manpower available to African planners. Even our knowledge of the physical resource base has not been substantially altered for most countries in tropical Africa. For some, it is true, the discovery of uranium deposits in the Sahara and along the eastern horn of Africa may bring a new hope. Somalia, Niger, and Upper Volta could become the African equivalents of Kuwait and other countries which have been able to purchase the fruits of industrialization without first having to go through the painful process of industrial transformation. For the majority of African states, however, this "windfall" prosperity must remain the stuff of which dreams are made.

Most of Africa must anticipate one of three courses. For the fortunate few that have within their boundaries some combination of iron ore, coal, hydroelectric power, oil, a reasonably skilled manpower pool, and some of the incidental mineral resources required for industrialization, there is the prospect of achieving a limited manufacturing base. That base, however, will not for some time to come meet the housing, food, and clothing expectations of more than a fraction of the citizens of these states. Moreover, the states which are among the best endowed in this respect—Nigeria, the

6

Congo (Kinshasa), Rhodesia, South Africa, and Angola—are among the states or territories which have the most pressing problems of political instability based upon inter-ethnic conflict.

There is a second category of political units with readily exploitable mineral resources, such as copper, zinc, vanadium, diamonds, uranium, and bauxite, which are required by the more highly developed states for the operation of a nuclear and jet age economy. Thus, Ghana, Sierra Leone, Gabon, and several others have been able, through the mining of minerals, to pay part of the costs of the new schools and hospitals and the infrastruture of roads, railroads, and harbors needed for modernization. Even here, however, there is often a tenuous reliance upon a single extractive industry. Thus grandiose development plans are in constant jeopardy as a result of world market price fluctuations, the development of man-made substitutes for these commodities, and political and military crises on the world scene.

For the leadership of states in the two preceding categories, the chief problem with respect to modernization differs mainly in degree from that faced by the leaders of mineral poor states. The harsh reality of Africa today is that the best for which they can hope is the limited prosperity which comes from an expansion in the quantity and quality of agricultural commodities. The overwhelming majority of the 200 million or more residents of sub-Saharan Africa are agriculturalists. Urbanization has certainly been a significant element in the rise of nationalism in the 1950's and 1960's and has provided the beginnings of modernization, but its impact has been limited. Between 80 and 90 percent of the people of the continent live in isolated homesteads, villages, and towns, seldom exceeding a few thousand inhabitants. Even those living in some of Africa's metropolises—including the largest Negro African city, Ibadan—have only tenuous roots in the urban complex. Social, political, and even economic ties are so strong that social scientists have great difficulty in describing urban as opposed to rural man in tropical Africa. An African may enjoy the paved streets and bright lights of the city, but he and his kinsmen are seldom far removed from the economy based upon the technology of the hoe or the plough, of cattle herding, or of gathering tree crops.

Despite the prevalence of an agricultural base, most African leaders are emotionally and ideologically committed to industrial development. It is understandable why this should be so. The promises made to their people in the anti-colonial struggle were based upon the assumption that industrialization would automatically

follow independence. Even in a country such as Tanzania, where the national leadership realistically committed itself in February, 1967, to a course of strengthening the agricultural sector instead of following the will-of-the-wisp of instant industrialization, not all Tanzanian leadership was pleased. In May, 1967, for example, Sheikh A. M. Babu, who had been Minister of Commerce during the nationalization of the banks in Tanzania, insisted that East Africa's economic salvation lay in heavy industries like iron, steel, and coal. "We must never rely on agricultural exports for our development in the long-term policy," he stated. To do so, he insisted, would leave Tanzania and its neighbors "wildlife states" or "banana republics" in a "world of giants."[1] Elsewhere in the continent the high priority placed upon industrial development is explicit in the typical five- and ten-year plans for economic development. There is frequently a sharp contradiction in those states between the political rhetoric which emphasizes the need for strengthening the rural agricultural sector and the desire for industrial growth. The Volta River project in Ghana (which may yet be Nkrumah's most positive monument) has been financed from the profits of the cocoa industry, rather than the proceeds from the Cocoa Marketing Board being ploughed back into rural transformation. The political realities of contemporary Africa often dictate that the leadership cater to the demands of the more politically alert urban minorities for paved streets, sewage plants, breweries, and other trappings of modern industrial society rather than to the unstated interests of the rural peasants.

The reluctance of African leadership to give a higher priority to agricultural over industrial development is matched by a positive hostility toward agriculture on the part of the educated youth. In Tanzania (then Tanganyika) from 1953-1956 I administered questionnaires on job preferences to middle and secondary school students in seven districts of the territory. The role of farmer, in most instances, ranked between seventh and tenth place, far behind that of teacher, government clerk, medical technician, businessman, and other prestigious and highly remunerative positions which would take one out of the rural environment. A decade or more later, J. D. Heijnen was more optimistic in his interpretation of the seventh-place ranking of agriculture as a vocational preference. He did indicate, however, that farming was invariably regarded as a standby occupation and not as one which an educated youth would choose willingly.[2]

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[1] Tanzania *Standard*, 18 May 1967, p. 1.

[2] "Results of a Job Preference Test Administered to Pupils in Standard VIII, Mwanza, Tanzania," in James R. Sheffield, ed. *Education, Employment and Rural Development* (Nairobi: East African Publishing House, 1967), pp. 431-443.

The attitude of educated Kenyan youth toward agriculture was well summarized by E. B. Castle. He said that the Kenyan youth:[3]

> allows himself to be pushed as a last resort into a farm school in the hope that this will make him want to be a farmer. Farming is not regarded as a "job"; one gets a "job" in the offices and towns and it is to the town that the more enterprising school leaver goes. Thus we have the tragic situation wherein the most needed type of work has the lowest status in the social consciousness. Even when a young man is tempted by bursaries to undergo agricultural training, he often does not intend to be a farmer but an "agricultural adviser" who keeps his hands clean. Or he may use this opportunity as a means of further education for getting an office job.

This paper aims to explore some of the foundations of this antipathy of Africa's educated leadership toward agriculture; to examine some of the consequences of this psychological attitude for development planning; and to suggest some possible strategies for dealing with this situation.

II Agriculture and Agricultural Education in Traditional African Society

In exploring the antipathy of Africa's educated elite toward agriculture, some understanding of the role of agriculture and agricultural education in traditional society will be helpful. Such an analysis need not constitute a "harping back" to a golden age. Indeed, the period of traditional society in many African states is still very much with us. Even in those states where the processes of modernization are well underway, vast numbers of people have been only lightly touched by the impact of the twentieth century or compelled only occasionally to be aware of the larger political and economic system which exists beyond their parochial villages.

Traditional agriculture could hardly be viewed as "golden." In many areas of east and central Africa the crude technology of the digging stick, the cutlass, and the hoe, as well as limited knowledge of means for retaining water and storing food continue to hold forth the promise of a famine every four to seven years. Even where starvation has not been a recurrent prospect, the lack of crop diversification and the paucity of scientific knowledge for dealing with natural disaster has meant for many of Africa's inhabitants a life of scarcity, undernourishment, and an inordinate amount of man's existence being devoted to extracting a meager and dull livelihood from the soil.

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[3] *Growing Up in East Africa* (London: Oxford University Press, 1966), p. 145.

This is not to condemn all aspects of traditional agriculture in Africa. Indeed, for every tribal group that has been characterized by its frequent resort to magic and propitiations to the ancestors in securing rain or a good harvest, one can point to others who had devised ingenious irrigation systems, had implemented highly successful techniques of cultivating the very complicated soils of Africa, and had risen beyond the parochial subsistence economy of the village to a sophisticated market economy which brought the agricultural people of the interior into contact with the peoples of the coast. Moreover, for all its deficiencies in the face of an expanding population, the traditional shifting system of cultivation found throughout the continent has been a fairly effective means for sustaining the fertility of the land against continual leeching by torrential downpours and the hot tropical sun. Indeed, given the highly varied conditions of soil within a given region, the unpredictable rainfall, and the great variety of grasses, weeds, birds, and insect pests which the African cultivator must face, it is remarkable that Africans have survived at all! The normal technological challenges that the African farmer faces are far more complex than those faced by his British or French counterpart in temperate zone latitudes.

In most of the 800 or more traditional societies of Africa, agriculture has provided answers to more than the material needs of the citizenry. The organization of cultivation, herding, hunting, and gathering is closely related to social, political, and religious matters. There has been a much higher integration of the various facets of life than has been realized by Western and other agents of innovation, who have tended to regard a hoe as simply a hoe rather than as a part of the religious and political system of the community. American and European advisers on land tenure reform frequently forget that the rules for allocating farm plots are based as much upon social as economic considerations. The outside agricultural advisers want to increase production by encouraging individual innovative skill and acquisitiveness. The traditional land allocation was based upon usufructuary right of occupancy, with one's holding expanding and contracting as his family obligations increased and diminished through his lifetime. The security of the community was more important than the technical skill of the individual. Similarly, the outside advisers who recommend land consolidation as the only means for insuring mechanization of agriculture fail to see (or don't care to take into account) that the fragmentation of land holding insured that the moderately fertile land was distributed widely instead of becoming the monopoly of the few.

A predominance of social and political over economic considerations was also evident among the cattle-herding people of East Africa. Agents of change regarded cattle from the standpoint of nutrition, the danger of soil erosion as a result of overgrazing, and other material considerations. They encountered stiff social and political hostility from people who viewed cattle as part of the prestige economy rather than solely as objects of consumption.

The traditional philosophy of agriculture did not view an increase in production as a desirable end in itself or as useful in meeting the needs of people far from one's village. Production was based upon the observable needs for food, clothing, implements, and prestige on the part of one's self, his kinsmen, and his neighbors. Surplus production did not necessarily increase a man's wealth; it often magnified one's obligations to family and community. Given the cooperative nature of the economic unit (whether it was the family, an age group, a village, or some other corporate unit), it was difficult to know which individuals were actually responsible for an abundant harvest or a successful hunt. Thus individual skill and talent were submerged in the collective enterprise. And part of that collective enterprise was the assistance given by extra-corporeal beings—ancestors and other spirits.

Since so much of traditional agriculture had social, religious, and political implications, the education of the young with respect to their role in the economy came largely as part of the process of growing up in a society. A man learned the economic role of each age grouping within the society as he passed from being the boy who chased the birds from the rice, to being the youngster who assisted in the harvest, and to being ultimately the man who cut down the trees and cleared the fields for seeding by the women. A similar sequence occurred for the girls of the community. A young man became a good hunter or cultivator by observing and emulating his father or uncle, by participating in the various religious performances associated with the stages of the annual agricultural cycle, or by sitting as a youth outside the circle of elders who reminisced about famous hunters, about locust invasions, or about the relative quality of land in the area. Traditional agriculture relied heavily upon informal observation and demonstration.

In addition, there was a system of apprenticeship for certain kinds of specialist roles, such as blacksmithing, weaving, and tanning. There was, moreover, in both east and west Africa, a fairly widespread formalization of the education process at the time of puberty. This situation was far from universal, however. There were separate

"bush schools" for each sex, and the initiates were normally secluded from their families for anywhere from a few weeks to several years. During this period of indoctrination, the youngsters were told not only about tribal history and lore but also many useful things with regard to the proper techniques of cultivation and hunting; the uses of herbs; plant and animal diseases; the art of basketmaking or honey collection; and the making and setting of animal snares and traps. At the end of the period, the young man or woman (who had frequently been subjected to circumcision or clitoridectomy during this time) emerged as a full member of the society.

However deficient both the informal and formal instruction in agriculture may have been in traditional society, it at least did not contribute to a sense of alienation toward the primary mode of earning a living in African society.

III The Colonial Legacy

It is a convenient tactic of many African nationalist leaders to attribute their contemporary ills to the policies and practices of the European colonial powers who dominated the African continent from the end of the nineteenth century until the 1960's. But it would be a gross error to assume that the record of the colonial powers in agriculture was entirely—or even essentially—negative. During this very brief period of political control, the continent of Africa blossomed as one of the great raw material producers of the world.

Most of the major export crops for which Africa is noted today were introduced from outside the continent and propagated by European missionaries, traders, and colonial administrators. Cocoa, for example, the leading crop in Ghana, was introduced during the nineteenth century from Central America—by way of Spanish Fernando Po and Portuguese Sao Tome. Sisal, the number one export commodity of Tanzania for many years, was introduced from Florida and Yucatan by the Germans at the beginning of their rule in East Africa. Cashew nuts, which are gaining added significance in Tanzania and Mozambique as the demands of the plastic industry create new uses, were also colonial imports from Central America. Peanuts, brought by the French from Central America in the 1820's, play a vital role in the development schemes of Leopold Senghor in Senegal. Even several staples—cassava, maize, swamp rice (as opposed to the indigenous upland rice), and wheat—were introduced from the New World or Asia.

Coffee is one of the few important export crops indigenous to Africa. It is now being produced in considerable quantities in the Ivory Coast and Kenya, many miles from its original homeland in Ethiopia. And many of the better strains of coffee trees were developed in Brazil, Arabia, or Reunion and subsequently reintroduced to Africa. Cotton and rubber have similar histories. They originated in Africa, but the current crops are the product of superior strains developed outside Africa. Furthermore, the marketing of palm oil, pyrethrum, and other crops indigenous to Africa has been initiated or dramatically altered as a consequence of the European colonial presence. The idea of mass production not only benefited the European planters; it also revolutionized agriculture for Africans. Fertilizers, insecticides, and weed killers provided new means for mastering the hard environment faced by African cultivators. The research programs introduced by colonial powers have continued the assault on the problems of agriculture under African management.

Roads, railroads, harbors, telegraph lines, and other infrastructures are making it possible for the economy of the entire continent to be transformed from a set of highly parochial subsistence-oriented economies to a market economy based upon global transactions. Without this elaborate system of communications and transportation —often constructed under almost impossible engineering conditions— only the coastal regions of the new African states would be shipping their agricultural commodities abroad and participating in the development process today.

Finally, for all of its ills, the colonial experience helped create new attitudes toward production, human nutrition, natural phenomena, and success in agriculture. The European school system conveyed the notion to many Africans that it need no longer be their fate to starve and suffer the physical maiming of nutritional deficiencies. Through technology and scientific information, the physical environment could, in many instances, be controlled or adapted to man's needs rather than leaving him the dumb victim of fate, magic, and witchcraft. The colonial experience showed, too, that much could be accomplished through role specialization and a rational division of labor instead of "each doing the work of all," as was typical of the traditional organization of work in Africa.

The Adverse Side of the Coin. In certain respects, however, the colonial experience was a disaster in terms of developing positive attitudes on the part of educated Africans with respect to the dignity of agricultural labor. In contrasting the European administrators' style of living with their own, it became difficult to convince

the African nationalist elite that they could achieve the good things of modern life for themselves and their people merely by taking a more rational approach to agricultural production.

Even in the most enlightened colonial territories, the European powers did not seriously consider the aspirations and desires of the Africans in colonial agricultural innovation. In some cases the non-African orientation was blatant, as in Kenya, Rhodesia, and other areas where African land was "sold" by the colonial governments or "leased" for 999-year periods to European settlers. Africans permitted to remain on the land which had been theirs stayed only as squatters or as part of a captive labor force which worked for very low wages. There were many instances of outright eviction, with the dispossessed Africans moving into less fertile reserves or gravitating to the small urban clusters beginning to form around the ports and district headquarters. In South Africa, Kenya, and Rhodesia, the total acreage of land alienated to Europeans told only part of the story. The alienated area was also the land which had a reasonably high fertility, a minimum annual rainfall needed for farming, low population density, and the absence to tsetse fly and other types of infestation. The Africans got what was left over.

The creative aims of the great agricultural revolution were often remote to the actual condition of the African peasant. The benefits which came to the cultivator as a result of the introduction of new crops were accidental byproducts of other activities. The colonial administrator in Ghana (the former Gold Coast), for example, got the Ashanti farmers to cultivate cocoa because the government needed revenues. Cultivated rubber was introduced in Nigeria to meet the industrial needs of Great Britain. Maize and other new staple crops were introduced in Kenya because the white settlers required a healthy labor force. The Sukuma cultivators of Tanzania were encouraged to plant cotton at the end of World War II to offset the impending British losses of India, Egypt, and the Sudan.

The long-run consequences of placing the imperial interests ahead of the interests of individual dependencies are being realized today. From an imperial standpoint it was rational to have Ghana concentrate on cocoa production, Tanzania on sisal, Nigeria on palm oil and rubber, Uganda on cotton, and Malawi (Nyasaland) on tea, rather than having each dependency compete with the others. This greatly simplified the problems of labor recruitment and training, grading and marketing of commodities, and research. With independence, however, it left the leadership of each new state managing a monoculture, the single crop being subject to drastic price

fluctuations in the world market and to the constant threat of man-made substitutes. Since so much depended upon this single crop, the economic development schemes of the new state were to be in constant jeopardy. It has been monoculture, perhaps more than any other single item, that has led the African leaders to be extremely skeptical of relying upon the agricultural sector in building a modern society. And the great fiascos of the Groundnut Scheme in Tanzania, the Yumdum Chicken Scheme in The Gambia, and the irrigation scheme of the French Office du Niger in Mali gave few African leaders confidence that a concerted campaign to add second and third crops in a hurry could be carried out with much success.

The Assault on the African Cultivator. The disenchantment of the African nationalist leadership with agriculture has been matched by the relatively low esteem in which farming and rural life are held by the African masses in general. Whether educated or illiterate, the average African does not anticipate having many of the good things of life come his way if he depends largely upon a career in farming. Actions of the colonial regime, both direct and indirect, severely limit the ability of today's nationalist leadership to galvanize the masses in terms of increased production even when the leadership itself is committed to the idea.

Much of the discontent stems from overt attempts by colonial agents to change the content and techniques of African cultivation. In the early days it was the political administrator (the British district commissioner or the French *commandant de cercle*) who assumed the responsibility for innovation. With only a liberal arts background acquired at Oxford or the Sorbonne, the political administrator was a rank amateur who played a kind of Russian roulette with the lives and fortunes of the several hundred thousand Africans under his command. His untutored advice could spell famine or pestilence and, only by accident, prosperity. The later addition of agricultural and veterinary officers provided a measure of expertise. The specialist staff, however, was very short handed; and even if they spent the better part of each month on tour in their districts, they could not hope to reach more than a fraction of the population. Consequently, they had little time in which to educate and persuade even if they had known the local language. They had—as will be noted shortly—to rely on coercion to make themselves even moderately effective.

The quality of the relationship between political officers and technical staff has had a serious long-run impact upon the development of technically competent African agricultural officers. This

was the snobbery which prevailed, at least in the British territories, between the two levels of the colonial service. It did not escape the notice of the status-conscious Africans that the Oxford or Cambridge trained district officers tended to look down upon the technical officers. Not only were the latter less well educated (a technical school education or at best a "red brick" university), but in many cases they came from Australia, Canada, South Africa, and other Commonwealth areas or even from Italy, Cyprus, or Goa. Since the specialist staff was treated in a subordinate manner, Africans did not aspire to fill their roles. They assumed that it was the occupation (rather than the origins of the staff) which accounted for the low prestige.

More serious than the status problems were the methods used by the colonial administration in securing agricultural innovation. In contrast to the traditional African technique of agricultural education, which relied largely upon demonstration and observation, innovation under colonial rule took place largely under threat of coercion. In British Africa (and there were counterparts in French and Belgian areas as well), the transformation of the economy took place, first of all, in response to the demands of the tax collector for cash rather than produce. The only way to secure cash in a subsistence economy was to grow a cash crop which could be sold to the European or Asian trader. Later the transformation was spurred through legislation (nominally passed by African councils or chiefs) which carried with it the threat of fines or imprisonment for failure to comply. There was, for example, a whole series of "thou shalt not" orders relating to the protection of forests, grasslands, water holes, and hunting preserves. There was a series, too, of "thou shalt" orders which required people to plant cash crops for tax purposes or an extra field of cassava as a reserve against famine. These were followed by orders which required Africans to plant in a specific way, rid their fields of proscribed noxious weeds, or use a specific manuring technique. Thus, through the constant threat of coercion, reform in agriculture was to take place. It was argued by the administrators that they did not have time to let education or cash incentives provide the stimuli to change; by the time these took effect, the natural resources of Africa would have been exhausted.

What made the coercion so objectionable is that administrators seldom took the time to present the reform in terms which were meaningful to the African cultivator. Being asked to increase production for its own sake, without any assurance that he would have

more things to buy or more schools for his children, made little sense. The only tangible results the peasant could observe from higher production were higher taxes, which were used to pay the salaries of policemen, tax collectors, agricultural officers, and others who would only make his life increasingly miserable. Moreover, the African farmer was constantly being asked to deal with problematical threats to his future (such as the denuding of forests where he and his forefathers had cut wood for generations without apparent loss) rather than to respond to the perceived needs of the present.

Colonial administrators argued that the value of coercion must be tested by the results. In areas where force was systematic and persistent, it did succeed in changing habits and the present generation of independent Africans is the richer for it. It is they who are bringing in the coffee, cashew, and cocoa crops which their fathers planted under threat of fine or imprisonment. Yet this argument fails to consider what the results might have been had education and incentives been provided. It ignores the question of how many really good and imaginative farmers left the land rather than continue to submit to senseless threats. Moreover, for many Africans, compulsory farming prejudiced their attitudes toward agricultural extension programs as being something the foreign colonialists wanted rather than something which would improve the lot of African farmers.

One final consequence of the punitive approach to agricultural innovation was to be of short-range disadvantage to the European colonial powers and of long-range disadvantage to the nationalists. This was the exploitation by the rising nationalists of the farmers' hostility toward the various agricultural rules and orders. Kwame Nkrumah, for example, capitalized upon the cocoa farmers' antagonism toward British orders which required the burning of all trees infected with the swollen shoot disease. TANU in colonial Tanganyika supported the protest of the Sukuma and other tribesmen against the cattle destocking orders which the British insisted were soil conservation measures. Later, as Nkrumah and Nyerere moved from their roles of "nationalist agitators" to being the responsible leaders of modernizing states, they found it politically difficult to reintroduce the very measures they once opposed.

In addition to coercion, the second major characteristic of agricultural reform during the colonial period was experimentalism. It was an experimental approach carried out by people with little prior experience with tropical agriculture; nor were they prepared to listen to their African charges who had, at the very minimum,

managed at least to survive at the subsistence level. The African had some crude knowledge of his soils, had worked out a rough technology, and had even developed a primitive meteorological "science." Ignoring what Africans knew about the inadequate rainfall of the Nachingwea area of Tanzania, for example, the British government invested millions of pounds on a groundnut scheme in an area where no reliable records of rainfall existed.[4] Late in the colonial day other administrators would agree with Robert Delavignette, who had served in the colonial service in French West Africa, that African agriculture:[5]

> was a complete mystery to us. . . . The whole situation was so different from what we had expected that we sometimes even denied to these people the status of peasants; we did not realize how they must have laboured and suffered to make their soil into cultivable land, and we regarded them as merely labourers, only fit to be used on European plantations.

Experimentalism often took the form of a doctrinaire approach to cultivation instead of taking into account the great variety of soil conditions throughout a territory. The technique of tie-ridge cultivation, for example, which proved so successful in one area of Tanzania as a device for retaining the rainfall on the land, proved to be disastrous when it was rigidly applied to another area of Tanzania with very sandy soils. It was only the action of the African peasants in planting "reserve" fields, by traditional means, far from the view of the European officers, that prevented famine when other crops were destroyed in a tropical downpour.

Experimentalism became such a regular feature of rural reform in Tanzania that the Africans referred to it as *wazimu wa mzungo* or the "white man's madness." It was to be anticipated that each new district officer or agricultural officer would have his pet projects. Since he could not possibly pay attention to the whole gamut of affairs which were legally under his jurisdiction, he concentrated upon one or more items which would be his contribution to district development (and possibly to his promotion as well). As soon as the Africans of his district, for example, discovered that the madness of the new officer was road construction, they could relax with regard to the soil conservation projects, the chicken schemes, and other programs of his predecessor. This not only led to a great deal of misdirected energy on the part of African cultivators; it also meant that

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[4] Actually, had they consulted the sixteenth-century journal of a Portuguese traveler, they would have realized that the area was a wilderness.

[5] Quoted in George H. T. Kimble, *Tropical Africa,* Vol. 1 (New York: Doubleday & Co., 1962), p. 138.

agricultural innovation tended to be both capricious and transitory. Projects once launched and then permitted to lapse were even more difficult to introduce at a later date.

Experimentalism failed, moreover, to take into account local taboos and prejudices. The assumption that "auntie knows best" led to many failures when a measure of flexibility in approach might have permitted the desired end to be accomplished by other means. Protein, for example, can be obtained from various plant sources (such as the leaves of the baobab tree), yet natural resource officers persisted in urging Africans to stock ponds with fish to overcome a protein deficiency, even though these particular Africans had a long-standing taboo against eating fish. Moreover, agricultural officers directed most of the educational efforts toward men, failing to recognize that agriculture was a community-wide enterprise and that many of the vital roles were reserved for women and children. In certain areas, it is the women who control land use. A husband moves to his wife's area at the time of their marriage, and changes in agricultural techniques take place only with the consent of the wife and her relatives.

The ultimate failure of the European reform of agriculture was the failure of the colonial system to provide appropriate incentives for increased production and meaningful channels for African participation in the economy. The African farmer always found himself at the mercy of outside forces: the international pricing system for bulk commodities; the territorial marketing boards; the banks which would not extend credit where the land was communally owned; the Indian or Lebanese traders who purchased his crops; and the Asian shopkeepers who offered only a limited display of consumer goods to be purchased with his profits. Producers' cooperatives did make a significant contribution to development (for example, among the coffee growers of Tanzania and the cocoa farmers of Ghana), but European colonial governments were generally reluctant to encourage the growth of this new corporate enterprise without elaborate supervision. Moreover, where peasant agriculture competed with European plantation agriculture, the colonial government gave far greater assistance to the latter. In Kenya, for example, Africans were successfully prevented from growing coffee on the grounds that it would lower the overall quality and increase the prospects for disease in the European coffee estates—despite the fact that the Chagga of Kilimanjaro in Tanganyika were demonstrating that Africans could not only grow high-grade coffee but could also manage a highly efficient cooperative society.

The Indirect Factors: Migration and the Educational System. The frontal assault of the colonial bureaucracy upon traditional agriculture and the stability of rural life was complemented by factors which indirectly undermined African attitudes toward agriculture. One was migration to the European estates or mining compounds, where money for taxes and other commodities could be obtained in far less time than from the sale of crops. Escape to the European enterprises or to the urban communities that were emerging at the ports and administrative headquarters also gave one some respite from the irrational harrassment of the district commissioner or the agricultural officer. Even where the migration was temporary, it did offer the attraction of the bright lights and conveniences which the rural areas lacked (or were slowly being provided through compulsory unpaid labor). The urban centers also had schools, clinics, and other facilities which came to the rural areas only after World War II as rural development schemes became the new—but belated—obsession of European colonial administrators.

In the long run, the most significant indirect cause of a general depreciation of the agricultural way of life was the European school system. As conceived during the colonial and pre-colonial periods and as perpetuated in many instances since independence, the formal Western school system has actually been counterproductive to the creation of a class of modern agriculturalists committed to resolving the primary economic problem of contemporary Africa.

This is not a criticism of the school system *per se,* for without the decades of sacrifice made by European missionaries and officials as well as African teachers, the new states would lack the statesmen, doctors, engineers, businessmen, and others required to run a modern state. Substantially the same type of liberal education will be required for the indefinite future if Africa is to meet its mounting need for more managers of the new societies and economies being fashioned during this transitional period from traditionalism to modernity. Nor is this criticism directed against the Christian missionaries who shouldered upwards of 90 percent of the educational effort in Africa prior to World War II and who continue to play a significant role in many states. It is specious to suggest that, had the missions done less, the colonial governments would have done more. The general record of the colonial governments in the fields of development and welfare was certainly not encouraging. When colonial governments did involve themselves in education at the early stages, it was to meet narrow needs for clerks, forest guards, market masters, and low-skilled assistants to the European technical staff.

The real criticism of the European school system is that it produced a child with a negative orientation toward agriculture. Given the fact that it divorced the African child from his environment, this consequence was perhaps inevitable. The alienation was physical as well as psychological. The boarding school was—and remains—a common feature of education not only at the middle and secondary school levels, but in many instances at the primary level as well. Obviously borrowed from the European tradition, the boarding system was justified as the only means for insuring regular attendance, a balanced diet for the children, and the proper environment for study—away from the heavy responsibilities that African children normally face in rural life.

The boarding school also separated the child from contact with the principle African religious, social, economic, and political structures which could make him a full participating member of his community upon completion of his education. Conversion to Christianity, often a requirement for enrollment, made him renounce the community-wide traditional observances based upon propitiations to the ancestors or the rituals and practices of Islam, such as the fasting during Ramadhan. Many of the rituals were related to the annual agricultural or herding cycle, and the mission-educated youth had no legitimate role to play in these observances. His absence from the family at critical times in the production cycle excluded him from active membership in the most meaningful economic and social unit of traditional society. Indeed, the entire system of economic relationships was disrupted by his reorientation from an extended family, based upon matrilineal or patrilineal rights and obligations, to a bilateral nuclear family. The boarding school also took the youth away from the tribal "bush schools." This meant he was deprived of life-long associations which would have been useful in providing economic and other assistance in time of need. Moreover, he was denied instruction in the time-tested methods of cultivating, hunting, and carrying out other activities related to successful rural life. He was in a sense an uneducated person, unprepared to face the problems of economic survival in his native community.

The curriculum of the schools in British and French territories also divorced the African child from his environment. The emphasis was upon literacy and rote memorization of data from the humanities and classics with little relevance to the African milieu. Technical and vocational subjects were largely ignored, as were the social and natural sciences, until fairly late in the development of most school systems—especially in those areas where fundamentalist Protestants

dominated. The rhetoric of colonial education officers seemed to support the wisdom of the Phelps-Stokes recommendations of the 1920's that African education ought to be practically oriented, but visible evidence of changes in curricula were hard to find. About the best that the schools could offer were garden programs which, through indifference or ignorance, were invariably doomed to failure.

Not until the end of World War II did British (and to a lesser extent French) administrators realize the consequences of the liberal arts orientation of the schools and attempt to introduce agricultural programs in the primary and middle schools. By then it was too late. Both educated and uneducated Africans alike assumed that the move was politically inspired and designed to prevent the educated nationalists from challenging the European colonial administration. Western education and control over one's own political, economic, and social destiny had become synonymous. Without Western education, how could Africans articulate their demands in European-controlled parliamentary institutions, and how could they make common cause with other African nationalists? The insistence upon an agricultural bias in the schools appeared to parallel other postwar developments, such as the British government's emphasis upon African participation in *local* government at the expense of national politics.

By the end of World War II, the essentially elitist orientation of the school system had become evident. Schools did not always begin that way, for in East Africa the mission schools were often founded to take care of slaves purchased from Arab traders. In West Africa, chiefs who were suspicious of the mission schools frequently sent their slaves instead of their sons to be educated. Over the years, however, the schools emphasized the privilege of the few: members of royal clans over commoners; Christians over Muslims and "pagans"; the urban coastal resident over the rural peasant; and those who could pay the school fees over those who could not. At independence there were few dependencies in which more than 10 percent of the school-age children were enrolled in schools, and the attrition rate between the first year of primary school and the beginning of secondary school was anywhere from 99 out of 100 to 999 out of 1,000. The latter fact was attributed in great measure to the rigid adoption of the European system of evaluating performance. Instead of continual and cumulative judgments being made, success or failure depended upon the single comprehensive examination. Since the examinations were administered by European agencies (the Universities of Bordeaux or Paris for French-speaking Africa, the Cambridge University syndicates for British Africa), there

was a rigid adherence to so-called European "standards" of performance and competence with respect to subjects which Europeans regarded as academically respectable. There was little attention to things African, particularly a subject so mundane as African agriculture. The pressures upon teachers and school authorities with respect to the required examination subjects effectively discouraged innovation either in subject-matter or in approaches to study.

Even the failures (the "school leavers," as they were euphemistically called) and the uneducated peasants supported the elitist notion of the school system. Having been exposed to a little education, the dropout felt too alienated, too embarrassed, or too proud to return to a life of toil on the farm and often became part of the growing group of urban unemployables. The illiterate peasant who had invested much, both financially and psychologically, to send a son or nephew to school did not expect that the educated youth would return to a life of farming with its low status. The "my son, the doctor" syndrome had become very strong in Africa. The uneducated family of the educated youth looked upon him as their window to good fortune. He would bring fame, political power, and wealth to his family and give assistance to them in time of need. It would thus, in their opinion, be a wasted sacrifice if the educated youth returned to a life of toil in the village.

This situation was compounded when the European powers ultimately got around to creating universities in colonial Africa. Although a few institutions of higher learning antedated World War II (such as Fourah Bay, founded in Sierra Leone in 1827, and Liberia College in the 1860's), the establishment of universities in Ghana, Nigeria, Uganda, and Senegal came almost on the eve of independence. The universities were staffed by expatriates who brought with them an obsession for "standards," academic tenure and academic freedom, and a limited view of the proper role of a university in a developing society. Engineering, agriculture, mass communications, and other mundane subjects were to be given very low priority. Of the 7,894 students enrolled in universities in tropical Africa in 1958-59, only four percent were taking courses in agriculture and a further seven percent were committed to engineering. The remainder was distributed among the humanities (20%), natural sciences (20%), social sciences (14%), law (12%), education (11%), medicine (8%), and fine arts (4%).[6] Given the kind of previous

[6] M. Brewster Smith, "Foreign vs. Indigenous Education," in Don C. Piper and Taylor Cole, eds. *Post-Primary Education and Political and Economic Development* (Durham: Duke University Press, 1964), p. 57.

educational training these students had received, anything else would have been surprising.

IV The Present Dilemma

Independence has now placed Africans in charge of the management of their own affairs in all but the last strongholds of colonial rule—South Africa, Rhodesia, and Portuguese Africa. Yet independence has not brought an end to misery and want. It has exposed a dilemma almost universal in Africa today—a conflict between an intense passion for education and an inability, or a reluctance, to acknowledge the critical role agriculture must play in providing the means for building new schools, as well as other aspects of modernization so strongly desired.

The UNESCO philosophy that education will solve all problems of humanity has perhaps its staunchest defenders in Africa. To most African leaders, education will overcome deficiencies in resources, capital, transportation, and other elements of industrialization. Equipped with the knowledge of the scientific world and with Western technology, African leaders will discover new resources, novel ways of combining old resources, and the techniques of management needed to provide better houses, more food, and an easier life for their people. As testimony to their faith, African governments have devoted a higher percentage of their national budgets to education than most developed or developing states elsewhere in the world. A very high percentage of foreign aid (both private and governmental) is related in one way or another to education. It is the largest "industry" on the continent. Not only is the base being rapidly broadened through an expansion of primary schools and adult literacy programs, but the capstone is being polished as well. There are few states without a national university, and several now have two or even more.

It is apparent, too, that the educational systems are under the control of Africans, even though there is a continued reliance not only upon expatriates from the former colonial metropoles but also upon new personnel hired or on loan from the Scandinavian countries, Israel, India, and the American Peace Corps. The cadre of foreign teachers is plainly on tap, not on top. The curriculum is now being molded to suit needs more clearly African in character. The religious aspect of the primary and secondary schools has been drastically curtailed. The examination system, even when tied to an external system of evaluation, has been modified to insure that there is greater attention to the history of the Wolof rather than to "our

ancestors the Gauls," and to the geography of the Nigerian rain-forest rather than to the English moors. Concessions have been made to the political problem of tribalism, and greater emphasis is thus being placed upon the development of civic loyalty, national identification, and the contributions of Africans to their common historic, artistic, and cultural fund.

Yet education remains substantially unaltered with respect to the role of agriculture. Nyerere's dramatic plans to reorient the curriculum of the primary and middle schools in favor of a heavy emphasis upon agriculture and rural development have not been emulated elsewhere.[7] Schools of agriculture and veterinary sciences remain relatively unpopular even in the new universities modeled after the American land-grant system. Despite the visible growth in the educational system, the long-run future of agriculture in Africa has become more bleak. Even though only a fraction of Africa's children are actually enrolled in schools, the school system has penetrated some of the more remote parts of the country and altered the expectations of those previously ignored by the colonial regimes. Now, as Bert Hoselitz has pointed out, "even a modicum of formal education provides the school leaver with a rationale for a job outside of farming."[8]

Few African leaders have found it politically possible to acknowledge that, at this stage of development, it might be better to exclude the new school program from the rural areas of the country where agriculture is still regarded as a normal way of life. Moreover, for fear of offending U.S.A.I.D. and other foreign advisers, few principals of African universities or ministers of education have asked whether it is really appropriate to have a Ph.D. program in agriculture in a society that regards farming with such disdain. The identification of agriculture with the university system has not, apparently, raised the prestige ranking of either. Colleges of agriculture are not only among the highest cost units of what is the most expensive higher educational system outside of North America, but there is a considerably small return on the investment.[9] Few students

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[7] Cf. Julius Nyerere, *Education for Self-Reliance* (Dar es Salaam: Government Printer, 1967); and *Socialism and Rural Development* (Dar es Salaam: Government Printer, 1967).

[8] "Investment in Education and Its Political Impact," in James S. Coleman, ed. *Education and Political Development* (Princeton University Press, 1965), p. 547.

[9] Frederick H. Harbison estimates that the cost of educating an African student in an African university in 1967 was about $3,000, which is perhaps even higher than the cost of educating that same person in America. Cf. "Education in the Development Process," in Allan A. Michie, ed. *Diversity and Interdependence Through International Education* (New York: Education and World Affairs, 1967), p. 133.

enroll in agriculture as a first preference; and once they are freed from any scholarship or governmental obligations, they quickly abandon their concern with agriculture in favor of a career in politics or administration. The general snobbery of their educated peers regarding agriculture and a rural existence is difficult to overcome.

In the many conferences of African educators regarding the role of the African university, it is apparent that the improvement of agriculture is only one among many priorities and not a very high one at that. The Tananarive Conference of 1962, for example, did not single out agriculture as an important item for concern, though it did indicate as the fourth priority that African universities should help the complete development of human resources for meeting manpower needs. This was subordinate to such objectives as maintaining "adherence and loyalty to world academic standards"; insuring "the unification of Africa"; and encouraging the "elucidation of an appreciation for African culture and heritage and to dispel misconceptions of Africa, through research and teaching of African studies." Innovation was still being subordinated to a fear of African academics being judged substandard by their former French or British mentors. There are other indications—the lavish housing, maid service, academic gowns, jokes in Latin at high table, and other evidences of an unsevered umbilical cord with the European founding institution—that a college of agriculture and veterinary sciences is very much out of place in certain universities in West Africa.

The reluctance of the university-trained agriculturalist to return to the rural areas to practice his profession, or even to serve as the administrator of an agricultural extension service, means that much of the task of stimulating innovation must fall to others. The rudimentarily trained African technical staffs that replaced the Europeans at independence are much more subject to political pressures from above and do not enjoy many advantages over European predecessors with respect to the establishment of rapport. Many are regarded simply as "alien" Africans, and the building of mutual respect is frustrated by long-standing ethnic animosities. They are, moreover, perhaps less familiar with the fundamental agricultural problems of the area than their European counterparts, and hence the most significant consequence of rapid Africanization of the technical service has been the loss of the "institutional memory" constructed during several decades of colonial rule.

Curiously, colonial tactics criticized by the nationalist leadership are now being employed by the governments of the independent

states. A Canadian student of Tanzanian politics, for example, reported an incident in which troops uprooted fields of cassava in an area where the farmers refused to plant cotton because they objected to purchasing the fertilizer to be used in cotton cultivation. At the national level, too, the students at the University College of Dar es Salaam regarded as coercive the National Service Program which required each university graduate to spend two years of his career in the rural sectors of the country where his talents were required. The protest by students in 1966 over this issue was met by the government's countermeasure of removing the striking students from the university for two years (later reduced to one) and returning them to their rural homelands. Finally, for a country like Tanzania, which has attempted to rely upon education to secure an improvement of agricultural and rural life, the forcible removal from Dar es Salaam of the unemployed was not calculated to make the rural areas attractive places in which to live.

V Possible Alternatives

Given the critical role agriculture must play in development planning and given the counterproductive tendency on the part of the formal educational system with respect to building positive attitudes regarding agriculture and rural life, what alternatives are available to African leaders?

No one seriously considers dismantling the present educational structure, and few expect any radical reorientation of the existing curriculum in favor of a strong agricultural bias. Indeed, the existing formal school system will have to be expanded if African states are to meet their growing needs for trained managerial talent and other types of manpower to run a modern bureaucracy as well as to transform the economy and social order.

The sad fact is that the poverty of most African economies, the shortage of trained teachers and schools, and other factors condemn most of Africa's children today to a life without literacy. Only 55 percent, for example, of Tanzania's school children can find places in the school system. Despite the egalitarian commitment of most of Africa's leadership, a wise use of scarce resources may compel national leaders to make the formal school system more—rather than less—elitist in scope. Nyerere, for example, has already curtailed plans for the rapid growth of the base of the educational pyramid in order to concentrate more effort upon the middle and

higher levels. To capture the best talent and make fuller use of existing facilities, more selective admissions procedures will have to be employed. There will have to be as well a continual and cumulative type of evaluation of student performance so that the selecting-out process takes place quite early, before expectations are raised too high. Finally, governments will be obliged to exercise considerable restraint in siting new schools to avoid spreading the system too thinly. A selective admissions and evaluation program should insure that those who do enter school and complete the first four or five years have a reasonable chance of finishing. Under present policy in most states, the student is carried along quite far and his expectations raised beyond the point of fulfillment, and then he is cast out to become part of the pool of urban unemployables. Such a wasteful approach to education not only creates threats to the political stability of the new states but places severe strains upon economies that are already overtaxed. The search for new revenues to finance this inefficient system either places the new state further in debt to foreign donors or results in a greater squeeze upon that sector of society which is still productive—namely, the rural agriculturalists.

To overcome the elitist quality of the formal school system, several things might be done. First of all, an attack will have to be made upon the boarding school concept in favor of community schools at the primary, middle, and even secondary school levels. The boarding school is a far more expensive proposition than renting or purchasing school buses. Indeed, the little red school house and the school bus are perhaps more significant American exports than the land-grant college. The divorce between the life of the child at school and his home atmosphere has to be ended. It should be recognized, moreover, that in America during the nineteenth century, the second generation school child was often the informal educator of his immigrant parents. Why should not the same process take place in Africa?

Secondly, the elitist tendency of the formal schools might be offset by a modest, rather than a radical, reorganization of the school curriculum and the school environment in favor of agriculture. The school garden programs of the past failed because the activity had little relevance to the examination system. It was supervised by European or African missionary teachers who knew little about local agriculture and were concerned with the problems of status. Natural science courses, however, could be made relevant to the school farm; and local expertise (the model farmer, the

herbalist from the "bush" school, and others) could be brought into the instructional program and the supervision of the school farm. The social science and literature courses, moreover, should be related to national and local conditions more than has been done since the severance of the colonial relationships. But above all, the school program must emphasize the dignity of labor by having the students perform meaningful tasks, both to further their own schooling (working off fee payments, for example) and to help in the support of school programs. As Nyerere has said with respect to students in Tanzania:[10]

> they do not learn as they work, they simply learn. What is more, they take it for granted that this should be so. Whereas in a wealthy country like the United States of America it is common for young people to work their way through high school and college, in Tanzania the structure of our education makes it impossible for them to do so. Even during the holidays we assume that these young men and women should be protected from rough work; neither they nor the community expect them to spend their time on hard physical labour or on jobs which are uncomfortable and unpleasant. This is not simply a reflection of the fact that there are many people looking for unskilled paid employment—pay is not the question at issue. It is a reflection of the attitudes we have all adopted.

Rural Transformation. What of the fate of the overwhelming majority who will never get to attend school; of the minority exposed to the educational system but weeded out early; and of the educated who must be attracted back to the rural areas as administrators, farm supervisors, and the others needed to increase the quantity and quality of agricultural production? What can be done to improve attitudes toward agriculture and rural life in Africa for educated and illiterate Africans alike? The answer, of course, lies far beyond the realms of school curriculum, garden programs, and the like. It requires an entire reorientation of the thinking of the urban educated elite who have inherited the reins of power in post-independent Africa.

Too much of the profits of increased crop production has been siphoned off by a national elite to light and pave city streets, build lavish parks, and in other ways inadvertently increase the lure of the city to the farmer. Even more radical programs than those launched by Senegal and Tanzania have to be undertaken to provide the hinterland communities with clean water, electricity, medical facilities, markets, recreational programs, and other amenities. The transformation must, moreover, involve local participation in decision-

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[10] *Education for Self-Reliance, op. cit.,* p. 13.

making. Only in that way can there be assurance that the vast fund of knowledge which the people possess about their environment will be tapped. Only through local consultation will be people feel they have an investment of time and money in making any new enterprise a continuing effort. While recognizing that the centralization of decision-making in the new states has been regarded as a safeguard against the emergence of tribal separatism, there must be some risk-taking in that direction to gain the active support of the local population in rural transformation. It has been demonstrated time and again in Africa that the people will give of themselves and even pay more taxes when they are brought into the process of improving their own condition.

In addition to improving surroundings for himself and his children, the individual farmer must be made to feel that there is an economic incentive to remaining in agriculture rather than following the will-of-the-wisp of a higher immediate salary in the urban industrial sector. Incentive can come only through continuous research and coordination of the activities of a variety of governmental ministries. The activities would include a greater diversification of crops so that farmers would not be destroyed by a fall in the price of a single commodity; price-fixing so that the system would reward the producer at the expense of the middlemen and the urban sector; greater research regarding new uses of agricultural commodities; more processing of raw materials at the site of production, thereby reducing shipping costs and keeping some of the increased profits in the rural areas; the provision of credit facilities; and appropriate governmental irrigation and land-reclamation projects.

There is one area of rural reform with which most governments are reluctant to tamper. That is the matter of land tenure. The traditional system of tenure, based upon usufructuary right of occupancy and fragmentation to insure social justice, is stoutly defended in many areas of the continent, and overt moves to consolidate holdings, permit registration and sale, and to alter other phases of land holding would probably accelerate the flow of rural migrants to the cities. Nevertheless, in areas which have long demonstrated an understanding of modern agriculture, it might be wise to follow the course of the Kenya government, which began land consolidation a few years ago and now has many yeoman farmers earning annual income of more than £1,000. This certainly has given agriculture a new prestige value in Kenya. Moreover, it is no accident that some of the most prosperous (and the most proud) farmers in Africa today are those in areas where coffee, cocoa, cashew, and other

tree crops are grown. Inasmuch as trees are normally owned by the person who plants them, and since nothing can be cultivated under trees that are closely planted, it matters little that the land in theory belongs to the community. In practice, the land belongs to the man with the trees; and his holdings may be expanded far beyond the normal acreage allotted to a subsistence farmer. Thus, "back door" private ownership of land has been a factor in increasing production, even though private ownership may conflict with the socialist ideology of many African leaders.

An imaginative program of rural transformation requires a great deal of political risk-taking. Not only must the national leadership resist vocal, organized urban elements determined to divert earnings from the agricultural sector into urban industrial development, the leadership must also be able to placate rural unrest as well. The leadership must be prepared, unless it is determined to fritter away its limited resources in behalf of its ideological commitment to egalitarianism, to engage in "pocket" development. It must single out areas where productivity is already high, attitudes toward agriculture still reasonably positive, and the eagerness of the population to participate in community development has already been demonstrated. General long-run improvement depends upon a short-run concentration of resources in areas with the greatest promise of transformation in the least amount of time. Some proceeds from "pocket" development can be rediverted to less-endowed areas. At the present stage of limited resources, it is far wiser not to disturb the existing patterns of subsistence agriculture than to raise expectations which cannot be realized.

Agricultural Education. The kind of agricultural education system an African state should have depends upon the manner in which production is, or will be, organized in that society. Unfortunately, whether production should be left to independent farmers, farmers banded together into cooperatives, private plantations, or managers of state farms is a matter ultimately of politics and ideology rather than technology alone. In the present stage of development, however, most countries possess a mixed economy. Cultivators in most states continue to farm as individuals or families, the land being communally owned and some of the work being organized by age, residence, or other group factors. Plantations exist in the states where there were large European settler communities. Some of these have continued in alien hands, but many have been broken up into small estates, purchased intact by Africans, or converted into state farms. Cooperatives—both those introduced by the

Europeans and the traditional ones which have been transformed in response to cash crop production—are fairly widespread. The state farm had its origins in the schemes of the colonial authorities to increase the production of groundnuts, cotton, and other commodities at the end of the war. Several states since independence—Ghana under Nkrumah, for example—have experimented with this form of production. To be effective, the agricultural education system would have to be sufficiently flexible to deal with each relevant kind of organizational approach.

The Small Farmer. For the mass of independent farmers growing cash or subsistence crops on small plots assigned on the basis of usufructuary right of occupancy, education should be visual and oral. To the greatest extent possible, use should be made of the still-functioning "bush" schools and other traditional means for educating the young with respect to local grasses, plant pests, and other positive and negative factors of the environment. Instructors in the "bush" schools might be the most effective persons to reach in attempting innovation with respect to new methods, crops, fertilizers, and insecticides. Agents of change should rely upon those who still command a wide measure of respect because of their traditional leadership credentials. The colonial powers, being concerned primarily with political stability, often failed to identify those individuals in traditional society who could be effective agricultural innovators.

Even greater use should be made of "model farmer" programs as an educatonal device in traditional society. The greatest impact would be upon the young adult. The "model farmer" (and both male and female should be identified) should be brought into the script-writing process for radio programs directed to the rural sector of the population. At the present, most of the scripts for national radio programs (which can be heard by large numbers thanks to the advent of the inexpensive saucepan and transistor radios) are written by and for the urban minority. Disseminating news about seeds, new farm implements, and other items through a modern medium blesses those items with modernity, just as the written word had almost a religious effect upon an earlier generation of Africans.

Extension work should also draw heavily upon local talent which not only commands respect but also understands in a practical way the limits of its environment. On my return to Tanzania in 1967 I encountered examples of "black man's madness" which almost matched the "white man's madness" referred to previously. In one instance an African official, an alien to the region, imported cattle herds for breeding without taking any prior steps to eradicate or control the tsetse fly.

Providing local model farmers with functional literacy may be the cheapest and most effective way of getting new programs across. Functional literacy would keep the cultivator abreast of new developments without alienating him from his environment as the formal school system might. Short courses at technical schools or demonstration farms for model farmers could compensate for the shortage of central government supervisory extension workers.

Cooperative Societies. Education for farmers involved in producers' cooperatives would follow at least the lines indicated above. Inasmuch as the existence of a cooperative is some index of a sophisticated approach to agriculture, the area would probably also be one where the formal school system, as well as a parallel school for technical training, could fill certain basic needs for the members of the cooperative society. In a cooperative society, it is not necessary that all the members be kept abreast of improved fertilizers, more effective sprays for crops, and new techniques for mechanical cultivation and harvesting. These are services which the cooperative society could hire for its members. The agriculture or cooperatives department of the central government could staff the schools which would be supported by the local societies. The local societies would also undertake the identification of candidates for this specialized training, and the pool of talent would consist of those who had completed primary or secondary school and still maintained ties with their rural homesteads.

Plantations and State Farms. The history of large-scale governmental operations in the field of agricultural production has been colored by the failures of such enterprises as the Groundnut Scheme in Tanzania (a case of lack of foresight, obsolete equipment, and an obstinate environment) and the state farm operations of Nkrumah in Ghana (a case of overcommitment to ideology and some unfortunate barter arrangements with the Soviet Union). The government farms tended to be capital-intensive and did not really solve the problems of employment or significantly involve Africans in a modern economy. They were run by Europeans and Asians. The Africans were brought in as short-term, unskilled laborers. Despite some setbacks, one can be sure that attempts will continue to be made in the direction of large agricultural schemes.[11] The relatively successful record of plantation agriculture in Africa, moreover, would indicate an expansion of that form of agricultural organization.

[11] A very critical study of 13 state farm enterprises in Kenya, Tanzania, Uganda, Mali, Upper Volta, Chad, and the Ivory Coast is contained in a 1967 study conducted by John C. de Wilde of the World Bank's African Department.

Insofar as education is concerned, both kinds of enterprises have similar needs. At one level, plantations and state farms require a cadre of secondary school, or even university-trained, farm managers, accountants, engineers, and agricultural specialists who could deal with problems of soil fertility, plant pathology, and other matters relating to the crops produced on the estates. At another level, both enterprises require skilled and semiskilled laborers who have not only specific training for required farm tasks but also a functional literacy of direct use to the job and an indirect support for psychological adjustment to the somewhat impersonal environment of the giant enterprise.

Although programs such as National Service in Tanzania and the various youth programs in other states might provide useful short-range employment at both levels of the large-scale operation, the compulsory nature of these schemes often has adverse results. Extraordinary efforts would have to be taken to make the enterprise attractive enough to have a continuing labor force. The lack of financial, social, and psychological incentives in the past resulted in a constant turnover of personnel, especially at lower levels. This increased the cost of training as well as complicating the problems of medical examinations, renovation of housing, and other matters. Therefore, extra inducements, such as family garden plots, primary schools, and social welfare and recreational programs, would be required to encourage the worker to relocate his family on or near the large estate.

Agricultural Education in a Formal Setting. What is the role of agricultural education in a formal setting?

Imaginative and effective farm schools paralleling the formal primary and middle schools are a possibility—as the Wairaka school in Uganda, for example, has demonstrated.[12] Such efforts, however, are burdened by having to compete with the more prestigious formal school. Thus the system must be made attractive to older youths and those who had legitimate reasons for terminating their enrollment in formal schools after the acquisition of basic literacy and mathematics. The curriculum has to be immediately practical to the farm situation; the instructors have to provide a daily example of the dignity of labor; and the school must not only provide tools, seed, and credit at the time of school-leaving, but it must be constantly prepared to give him advice after the student is on his own.

[12] Cf. John W. Hanson, *Imagination and Hallucination in African Education* (Michigan State University, c. 1967), pp. 35-37.

Agricultural training at the secondary school level has seldom been designed to create independent farmers, since the traditional forms of land tenure usually make it difficult for one so well trained to use his talents to the fullest. The only exceptions I have encountered are in the areas where tree crops have permitted a measure of de facto private ownership and a single farmer may have several thousand coffee or cocoa trees under his control. Normally the agricultural secondary school has been oriented toward training agricultural assistants who provide most of the extension work for the central government's ministrys of agriculture. The more effective agricultural secondary schools take a fairly broad view of their mandate, examining crop husbandry, soil and water conservation, agronomy, animal husbandry, elementary animal hygiene and health, fisheries, forestry, and elementary economics. Great care, however, must be taken to select students who have a high commitment to agriculture. The agricultural secondary schools should not serve simply as second choices for those not admitted to the college preparatory schools. Great care must be taken in placement, too, to insure that ethnic and other factors do not serve as barriers to effective innovation.

The role of agricultural education in the institutions of higher learning is a difficult one. African states need field staffs in the departments of agriculture who have more than a liberal arts education. State farm and other large-scale enterprises probably cannot be managed by those with only a secondary school certificate. It is also apparent after two decades of experimentation that the inclusion of colleges of agriculture and veterinary sciences within the general university framework has not given the desired respectability to agriculture. Indeed, the snobbery of fellow students has probably contributed to the demoralization of the agricultural student. Nevertheless, there is a legitimate place in higher education for a concern with the problems of agriculture in Africa, and means must be taken to strengthen this effort. Whether the colleges of agriculture must be included within the general university or established separately in a rural setting; whether the curriculum ought slavishly to follow that of colleges of agriculture in more developed societies for fear of being labeled substandard or whether they ought to venture out into programs more closely adapted to the needs of Africa; and whether a Ph.D. program is a necessary investment are questions which must be raised. Certainly if the agricultural courses in the universities recruit their clientele from among those who have gone through the ivory-tower environment of the primary and secondary school boarding systems, it will be difficult to develop and sustain a commitment to life in a rural setting. It might be far better to

revise the curriculum to attract those who come up through the agricultural secondary schools and select students who combine good academic performance with a demonstrated interest in extension work.

A further question is related to the matter of agricultural research, which is certainly a *sine qua non* for a developing society. Africans must be constantly concerned with the task of finding new crops, better strains of existing crops, diverse uses for agricultural products, and ingenious ways for dealing with the mounting problems of plant and animal diseases. For research in agriculture to be effective there must be a continual two-way communication between the scientists and the farmer in the field. There is no absolute reason why a nation's agricultural research program should be vested in an ivory-tower university setting as opposed to operating as a separate research enterprise which could service an entire region of the continent faced with similar problems. There is no reason either why African states at this stage of development should feel bound, as a matter of pride, to allocate very scarce resources for the higher education of their nationals as soil scientists if students have to be coerced into these subjects or if they fail to follow through on the national investment at the end of their training. For some time to come it might constitute a cheaper and more effective use of national revenues to hire research services in agriculture from whatever sources are available. If the political leadership feels that it must develop its own cadre of nationals in the agricultural sciences, it might be a wiser course to send them to India, Mexico, or the West Indies to receive training in tropical agriculture than to establish very high-cost institutes in Africa.

Finally, it must be realized that the role of the African university in rural transformation must go far beyond the narrow mission assumed by colleges of agriculture and veterinary sciences. Indeed, the genius of the land-grant college in America is that it did not address itself merely to the problems of the vocational role of one sector of society. It addressed itself in a highly pragmatic fashion to the entire human condition and sought the development of a livable society. The new university in Africa must assume a broad mission with respect to rural transformation and the reshaping of African attitudes regarding agriculture. It is a mission which will encompass the more traditional disciplines of history and literature but will include as well the efforts of the sociologist, the political scientist, the instructor in business management, the journalist, and the authority in audio-visual and other kinds of mass communications. The African university must be prepared to adopt a pioneering approach to the study of the African environment and not accept the ready-made formulae of either Europe or America.